SUBJECT: Panel Retrieval From Pegasus Satellite Task 18 Case 218

DATE: May 13, 1966

FROM: T. C. Tweedie, Jr.

MEMORANDUM FOR FILE

In a previous memorandum* the orbital lifetime of the three earth orbiting Pegasus satellites was calculated. As discussed in the memo, these calculations were based on information obtained from the Orbital Flight Handbook. The data and tables in this book in turn are based on the ARDC 1959 model of the earth's atmosphere. This model atmosphere indicates that the atmosphere extends to relatively high altitudes and hence one infers increased drag and short lifetimes for earth orbiting satellites.

A more sophisticated model of the atmosphere is now being used by Marshall Space Flight Center for their orbital lifetime determinations. In developing the alternate atmospheric model, MSFC has included such atmosphere-affecting terms as solar activity, seasonal variations and diurnal bulge. The added terms, especially the correction for solar activity, result in a model atmosphere which is less dense at high altitudes and hence produces less drag on earth orbiting satellites.

The Pegasus lifetime calculations based on the ARDC 1959 atmospheric model are conservative and serve for planning purposes to bound a lower limit. Lifetime calculations based on the MSFC atmospheric model indicate a longer orbital duration for the three Pegasus satellites, A, B, and C. Based on the MSFC data, it is suggested that, for planning purposes, rendezvous with Pegasus C and panel retrieval be included in the early SAA program. This is the only satellite of the three on which easily removable micrometeoroid panels (coupons) are installed. The orbital decay and remaining lifetime in orbit of Pegasus C will be subject to periodic review by analysis of the changing satellite altitude as reported by Goddard Space Flight Center in the Satellite Situation Report.

I wish to acknowledge a useful discussion with Mr.

*"Feasibility of Meteoroid Panel Retrieval from Pegasus Satelllite," Memorandum for File, T. C. Tweedie, Jr., March 25, 1966

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(NASA-CR-158199) PANEL RETRIEVAL FROM PEGASUS SATELLITE (Bellcomm, Inc.) 1 p

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Robert Benson of MSFC on their atmospheric model.

T. C. Tweedie Jr.

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T. C. Tweedie, Jr.

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